Appendix: H – EMS Performance Improvement and Quality Management

Contemporary performance management and improvement activities are focused on result orientated outcomes. Success is measured against other industry benchmarks when applicable and available. The National Highway Transportation and Safety Administration provide many templates of results-based quality improvement, including an online version of Quality Improvement for EMS Leaders, as does the National EMS Managers Association. In essence, these results-based measures of performance create a customer-focused EMS clinical scorecard.

The proposed Fontana Fire Protection District should intend to use standardized clinical performance measures to monitor and if necessary, make improvements to the overall program. One appraisal anticipated for use is the International City Manager Association's Fire and EMS reporting performance measurement.[41] This allows for some degree of benchmarking. The proposed District should carry out annual comparisons of internal performance measures in the areas of response time, inspections, fire loss, plans review, and revenues.

Consideration should be given to identifying opportunities for objective measurement and evaluation of the success of the EMS program. Within the health care and public safety industry, typical quality measurements usually focus on two areas — those concerning the medical outcome of the program and those relating to the demand for service. Frequently used EMS measurements of medical outcome include intubation success rates, trauma scene times, chest pain management, and shortness of breath performance. Examples of service demand measurements include unit hour utilization, failure rates, and concurrency rates.

In a typical quality management program, goals are established for broad areas of clinical responsibility, first followed by the creation of quantifiable medical outcomes. Data is subsequently collected and compared to goals; protocols are reviewed and training objectives adjusted as appropriate to meet the desired outcomes. As an illustration of this quality management process, the reduction of chest pain might be chosen as a worthy clinical goal. Measurements of success would include pre- and post-incident collection of the pain management score. Based on the evaluation of the collected data, in-service training and/or feedback systems might be used to adjust the performance of field personnel to successfully meet the clinical goal.

[41] What Works: Management Applications of Performance Measurement in Local Government, International City/County Management Association (ICMA), 2001

The proposed Fontana Fire Protection District also could use a customer satisfaction survey, sent out and collected by the proposed District. This instrument would provide a means for prompt follow-up to citizens who use the emergency medical service system. Another avenue of proposed exploration is adding follow-up telephone surveys, which tend to permit more interaction and feedback between the proposed District and the residents.

Many EMS service providers choose to use a management tool called a "balanced scorecard." This system of strategic management was developed in the early 1990's by Drs. Robert Kaplan (Harvard Business School) and David Norton to enable organizations to clarify vision and strategy, and to translate those elements into action. The methodology provides feedback from internal business processes and from external outcomes in order to improve strategic performance and results continuously.

Kaplan and Norton describe the innovation of the balanced scorecard as follows:

> "*The balanced scorecard retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation.*"

Balanced scorecard management suggests that each organization be viewed from four (balanced) perspectives. Measurements are developed and data is subsequently collected and analyzed relative to each of the four. The perspectives are:

- The learning perspective
- The business process perspective
- The customer perspective
- The financial perspective

Advanced Life Support (ALS) Deployment

While general emergency service delivery is discussed in the discussion on NFPA 1710 (Appendix: G – National Fire Protection Association Performance Standard 1710), we focus here specifically on the

outcome of the EMS program. NFPA Standard 1710 includes three time criterion relative to EMS that are important to assure a successful medial outcome. The three are summarized below:

- Turnout time within one minute, 90 percent of the time.[42]
- Arrival of a unit with first responder (basic life support) or higher level of capability within four minutes, 90 percent of the time.[43]
- Arrival of an advanced life support unit, where this service is provided by the fire department, within eight minutes, 90 percent of the time.[44]

Notably, NFPA Standard 1710 speaks just to the time necessary to place levels of care at the emergency scene (i.e. BLS and ALS) and *not* to the time required for the arrival of an ambulance. The arrival at an EMS emergency scene of a paramedic on an ALS-equipped engine within five minutes of dispatch meets the standard's requirements for first responder *and* for ALS. In the Plan for providing Fire and EMS Service, the proposed Fontana Fire Protection District should continue the current ALS response practice with the ALS transport provider.

Response times are one of the most frequently used methods of measuring system performance. Policymakers and physicians require a gauge by which to measure the effectiveness of the system, and a method by which to make decisions. Unfortunately, very little medical research exists to support one response time over another. Further, because economic costs are highly sensitive to response times, a small change in response time requirements may cause a significant change in costs.

However, several medical studies suggest that shorter response times lead to improved outcomes in cardiac arrest. While the studies are not consistent in their conclusions, one thing is constant — the analyses focuses on the most critical one or two percent of the patients and not on the more common emergencies (i.e. chest pain, diabetic coma, stroke, and respiratory events) at which advanced personnel can influence patient outcome. Very little reliable scientific data is available to support any response time requirement in these cases. Yet despite the confusing nature of the studies, intuitively we believe that delivering faster emergency services does have an effect on patient satisfaction, improved 9-1-1 use in emergency events, and enhanced patient outcomes.

---

[42] Turnout time is defined as the time beginning when units acknowledge notification of the emergency to the beginning point of response time. This does not include time to receive a 9-1-1 call nor the time required to dispatch the call.
[43] Six minutes overall (dispatch one minute, turnout one minute, emergency response four minutes).
[44] Ten minutes overall (dispatch one minute, turnout one minute, emergency response eight minutes).

Finally, the American Heart Association considers critical components of EMS systems to include appropriate access by citizens as well as timely dispatch of responders[45]. According to the Heart Association,

> *"Passage of time drives all aspects of emergency cardiac care and determines patient outcomes."*

That is why it is essential that patients are able to access the 9-1-1 system as quickly as possible and that responders are immediately dispatched to the scene with appropriate pre-arrival information.

Under this plan, creation of a local response performance is fundamental to measuring the level of service provided to the community. The proposed Fontana Fire Protection District should enlist the community and consider carefully the balance between the economic costs, medical costs and benefits, and social costs of response time requirements.

[45] *Advanced Cardiac Life Support*, American Heart Association, 1997